

WHAT IS CLAIMED IS:

1. Radio communications apparatus comprising:  
a quadrature modulator for making the transition of the  
5 phase of a modulated wave via a in-phase component and a  
quadrature component;  
a first voltage-controlled oscillator for outputting a  
first transmission signal;  
a second voltage-controlled oscillator;  
10 a first mixer for frequency-converting the first  
transmission signal based on the output signal of the second  
voltage-controlled oscillator;  
a phase comparator for comparing the phase of the output  
signal of the quadrature modulator with the phase of the output  
15 signal of the first mixer;  
a low-pass filter for filtering the component below a  
predetermined frequency of the output signal of the phase  
comparator and supplying the resulting signal to the frequency  
control terminal of the first voltage-controlled oscillator;  
20 and  
a first band-pass filter for outputting a signal obtained  
by filtering the component in a predetermined frequency band  
of the output signal of the quadrature modulator as a second  
transmission signal.

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2. Radio communications apparatus according to claim  
1, further comprising:  
a third voltage-controlled oscillator;  
a second mixer for frequency-converting the output signal  
5 of the first band-pass filter based on the output signal of  
the third voltage-controlled oscillator; and  
a second band-pass filter for outputting a signal obtained  
by filtering the component in a predetermined frequency band  
of the output signal of the second mixer as a second transmission  
10 signal.

3. Radio communications apparatus according to claim  
1, further comprising:  
a second mixer for frequency-converting the output signal  
15 of said first band-pass filter based on the output signal of  
the second voltage-controlled oscillator; and  
a second band-pass filter for outputting a signal obtained  
by filtering the component in a predetermined frequency band  
of the output signal of the second mixer as a second transmission  
20 signal.

4. Radio communications apparatus according to claim  
1, further comprising:  
a first transmitter for amplifying a first transmission  
25 signal output from the first voltage-controlled oscillator and

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transmitting the resulting signal via an antenna; and  
a second transmitter for amplifying a second transmission  
signal output from the first band-pass filter and transmitting  
the resulting signal via an antenna.

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5. Radio communications apparatus according to claim  
2, further comprising:

a first transmitter for amplifying a first transmission  
signal output from the first voltage-controlled oscillator and

10 transmitting the resulting signal via an antenna; and

a second transmitter for amplifying a second transmission  
signal output from the second band-pass filter and transmitting  
the resulting signal via an antenna.

15 6. Radio communications apparatus according to claim  
3, further comprising:

a first transmitter for amplifying a first transmission  
signal output from the first voltage-controlled oscillator and  
transmitting the resulting signal via an antenna; and

20 a second transmitter for amplifying a second transmission  
signal output from the second band-pass filter and transmitting  
the resulting signal via an antenna.